

Searching for New Forces with Dark Light

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Cosmic motivations and anomalies in precision measurements have encouraged standard model extensions in the form of Dark Photons or, more generically, a new force-carrier. Existing experimental searches for such particles have probed the majority of the parameter space of simple models, but so far no culprit has been found and the standard-model anomalies remain unexplained.

The recent report of anomalous correlations in ^8Be transitions has heightened interest in a potential new particle near 17 MeV. Although this region has been partially explored via hadronic production mechanisms, a particle with proto-phobic couplings is more effectively probed using leptonic production. The DarkLight experiment proposes to search for this particle in the invariant mass spectrum of e^+e^- pairs produced in electron-nuclear scattering. I will give an overview of the staged approach we have taken, including recent tests at the LERF facility at JLab and designs for a future large-acceptance detector, and also our near-term proposal to install a spectrometer pair at the CEBAF Injector to search for this signal in an intensity regime where backgrounds from accidental coincidence dominate.

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